

Patent claims

1. Method of producing a three-dimensional object by layer-by-layer solidifying of a material solidifiable under the action of electromagnetic radiation or particle radiation at places corresponding to the cross-section of the object in the layer by using a mask-generating device which can be controlled as a function of the cross-section of the object in the respective layer for generating a mask for selectively transmitting the electromagnetic or particle radiation, characterised in that the intensity of the radiation is controlled within areas to be irradiated.

2. Method according to claim 1, characterised in that the intensity is reduced if the area to be irradiated is located above an area with non-solidified material of a layer located below.

3. Method according to claim 2, characterised in that the intensity is reduced between 5% and 60% of an intensity which is required to connect a layer during solidification with the layer located below.

4. Method according to one of claims 1 to 3, characterised in that the intensity is controlled via control of the transparency of the mask for the radiation.

5. Method according to one of claims 1 to 4, characterised in that an intensity profile of the radiation over the layer during irradiation of a layer is measured and the

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intensity profile is used in controlling the mask for the next layer to be solidified.

6. Method according to one of claims 1 to 5, characterised in that a transmission LC display with gray scales is used as mask-generating device, wherein control of the intensity takes place via triggering of the gray scales.
7. Method according to one of claims 1 to 6, characterised in that visible light is used as electromagnetic radiation.
8. Method according to claims 7, characterised in that a polymer which hardens under the action of visible light is used as solidifiable material.
9. Device for producing a three-dimensional object by layer-by-layer solidifying of a material solidifiable under the action of electromagnetic or particle radiation at places corresponding to the cross-section of the object (4) with a device (21) for producing the electromagnetic or the particle radiation,
an object carrying device (5) for carrying the object to be formed,
- a device for applying a layer of the material to the carrying device or a previously formed layer,
- a mask-generating device (22) for generating a mask for selectively transmitting the electromagnetic or particle radiation at the places corresponding to the cross-section of the object in the layer and
- a control device (30) for controlling the mask-generating device, which is constructed in such a way

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that it controls the intensity of the radiation transmitted by the mask as a function of a predetermined solidification depth.

10. Device according to claim 9, characterised by a deflection device (26), arranged between the device for generating the electromagnetic radiation or the particle radiation, which deflects at least part of the radiation transmitted by the mask, and a detector device (27) for ascertaining an intensity profile of the radiation deflected via the deflection device.
11. Device according to claim 9 or 10, characterised in that the generating device (21) for the electromagnetic radiation is a light source for visible light and the mask-generating device (22) is constructed as a transmission LC display.
12. Device according to claim 11, characterised in that the LC display has a gray scale resolution.

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